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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,463	06/12/2001	Michel Pagniez	01076	2261

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EXAMINER	
HELMER, GEORGIA L	

ART UNIT	PAPER NUMBER
1638	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/821,463	PAGNIEZ ET AL.	
	Examiner	Art Unit	
	Georgia L. Helmer	1638	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *13 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *16-18,20-27,30-32,36 and 37* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *16-18,20-27,30-32,36 and 37* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Status of the Claims

1. The Office acknowledges receipt of Applicants Response; dated 13 July 2004, Applicant has cancelled claims 1-15, 19, 28-29, 33-35, and added claims 36-37. Claims 16-18, 20-27, 30-32 and 36-37 are pending, and are examined in the instant action.

2. This action is made FINAL.

3. All rejections not addressed below have been withdrawn.

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

5. Claims 16-18, 20-27, 30-32 and 36-37 are rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 16 is an improper method claims, as the final step does not produce the desire product, namely "transgenic plants".

In claim 16, (a1) line 5, "the transformants" lacks antecedent basis.

In claim 16, (a2) line 6, "the transformants" lacks antecedent basis.

In claim 16, (b) line 1, "the use of" needs to be inserted between the words "by a". In line 3, "the" or "said" needs to be inserted between the words "and peroxidase".

Claim 16,(c), line 1, "the selected transformants" lacks antecedent basis; In line 2, "plantlets" lacks antecedent basis.

In claim 16, (d) line 1, "the T-DNA of pRi of Agrobacterium rhizogenes" lacks antecedent basis, as does "pRi of Agrobacterium rhizogenes". In line 2-3, "said sorted plants" lacks antecedent basis. In line 4, "the transgene" lacks antecedent basis. All recitations of this language are also rejected.

In claim 20, line 3, a "a change of color" of what?

In claim 20, "the gene of interest" lacks antecedent basis.

Claims 31-37, dependent on claim 16, only function for the (a2) step of claim 16.

All claims dependent on these claims are also rejected, for the reasons stated above.

Claim Rejections - 35 USC § 112 -Enablement

7. Claims 16-27, 30-32 and 36-37 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement, to the extent that this is a new rejection, it is required by Applicant's amendment. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The enablement issues are ", "Agrobacterium rhizogenes containing a vector", a T-DNA ", and "sorting ". Enablement is considered in view of the *Wands* factors (MPEP 2164.01(a)):

Nature of the invention. The claims are drawn to a method for obtaining transgenic plants, comprising transforming plant cells with Agrobacterium rhizogenes containing a vector varying a gene encoding a protein producing hydrogen peroxide,

and a protein of interest, selecting transformants which express the hydrogen peroxide producing protein using a peroxidase-based colorimetric test, regenerating plants from roots selected and sorting according to phenotype and allowing selection of plants containing only the transgenic and not the Agrobacterium rhizogenes T-DNA, where the protein of interest is an endochitinase, where the protein of interest confers resistance to disease caused by an organism selected from the group consisting of fungi, bacteria, arthropods and nematodes, or any pathogenic agents, where the protein of interest is a protein of agronomic or industrial interest.

Enablement is considered in view of the *Wands* factors (MPEP 2164.01(a)).

The breadth of the claims and the nature of the invention.

The state of the art and the predictability or lack thereof:

The state of the art is high, with many detailed laboratory manuals for protocols of plant tissue culture and for plant molecular biology being available, as well as information in textbooks and on the internet. However plant culture and transformation is unpredictable: The state of the art is that "plant transformation is an art because of the unique culture conditions required for each crop species. To accommodate a genotype or species that has not been manipulated in culture previously, one must either adapt an established protocol or create a new one." (Hansen et. al., 1999, Trends in plant Science, vol 4, pages 226-231, see page 230).

Applicant claims all cells and all explants of dicot plants, including shoot, hypocotyl, root, flower, leaf, stem and seed parts. The regeneration of plants from

explants is unpredictable, and explant selection is critical for successful plant regeneration. See Tisserat, in Plant Cell Culture, ed R.A. Dixon, 1985, IRL Press, Oxford, pages 79-105, especially page 80, Table 1, page 82, and Table 4, pages 85-90.

Applicant claims a method of obtaining transgenic plants by transforming with Agrobacterium rhizogenes to insert a transgenic gene encoding a h202 producing protein whereby the enzymatic activity of the this protein is used to indicate the transgenic events. However, **all plants** contain in their basic metabolic machinery proteins which produce H_2O_2 (Buchanan, et al. Biochemistry & Molecular Biology of Plants (2000) American Society of Plant Physiologists, Rockville Mad 20855, pages p. 32-33). It is unpredictable that a method of detection using a H_2O_2 producing protein gene would function as desired because all cells of all plants would or could demonstrate positive detected events.

Re *Agrobacterium rhizogenes containing a vector carrying a T-DNA comprising a gene...encoding a H_2O_2 producing protein* .... Applicant's specification (Figure 1,) depicts a T-DNA claiming vector with an oxalate oxidase sequence. One T-DNA. At no place is it clear that another T-DNA indicated.

Applicant further claims production of transgenic plants containing only the transgenic and not the T-DNA of pRi. The only way that such segregation can occur, at a minimum, is under the conditions that the two T-DNAs are on two separation replicons. If two T-DNAs are present, how did they get there? Are they in the same Agrobacterium cell or in different Agrobacterium cells? Are the two T-DNAs on the same plasmid or on different ones?

Re "sorting" the plantlets which do not contain the T-DNA of pRi Agrobacterium rhizogenes'". Applicant claims "sorting" the plantlets which do not contain the T-DNA of pRi Agrobacterium rhizogenes'". Applicant does not teach any basis for discriminating those that do and those that do not contain the T-DNA of pRi Agrobacterium rhizogenes. While one of skill in the art can sort based on some discriminable parameter, to do so without further guidance is unpredictable and would require random trial and error experimentation.

Guidance and presence of working examples. Applicant merely provides prophetic examples of a method of Agrobacterium rhizogenes transformation of Brassica napus stems, tomato , tobacco or cauliflower with a plasmid pH100, production of root tissue and possible identification of H_2O_2 producing tissue using a colorimetric assay. Applicant has not provided a single exemplified example of the claimed invention. No results of experimental work are given.

Experimentation required: Undue experimentation would be required to determine which dicot plant cell or explants to use, out of a vast quantity and explant including stems, hypocotyls, roots, flowers, leaves, ovules, anthers, or cotyledons, of any and all dicot plants, which explant or which plant would function as desired upon transformation with Agrobacterium rhizogenes, bearing any T-DNA , and any gene encoding an H_2O_2 producing protein, of which many are known. There are an infinitely large number of combinations of specific plants and plant explant type; these factors alone would require an exceeding large number of sets of experiments to determine

which ones would function as desired. Having made decisions based on these experiment parameters, experimentation would then be required to determine which stain of Agrobacterium rhizogenes, bearing which if any Ti plasmids, and if yes, which Ti plasmid and are there heterologous sequences present in the plasmid and what is their relationship to any T-DNA, and if a gene encoding a protein of interest is present, how does that gene encoding a protein of interest relate to the various other DNA sequences present (same piece of DNA, or different, cis or trans, chromosomal or not) to function as desired. Having determined these parameters, experimentation would then be required which gene encoding an H2O2 producing protein, would function as desired, especially given the fact that all plants contain endogenous genes encoding an H2O2 producing protein, and which peroxidase-based colorimetric test, and what kind of sampling is done and how much if any endogenous background is present? Then how is sorting done: by a phenotype, or by presence of mRNA using dot blots, or by PCR using DNA or a combination of all the above. Applicant must provide sufficient guidance to address all these issues. Without such guidance the experimentation required would not be routine, but would be undue. This would impose a burden on the skilled artesian, without a reasonable expectation of success.

In view of the breadth of the claims (any cell, any explant, any dicot plant, any vector, any protein producing hydrogen peroxide, any gene encoding an H2O2 producing protein, any peroxidase-based colorimetric test, any T-DNA and any gene of interest, any means of sorting) the lack of guidance in the specification, and the

unpredictability in the art, undue trial and error experimentations would be required to enable the invention as commensurate in scope with the claims.

Claim Rejections - 35 USC § 103

8. Claims 16, 19, 24, 25, 30, 32 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Simpson, et. al., A disarmed binary vector from Agrobacterium tumefaciens functions in Agrobacterium rhizogenes, Plant Mol. Biology, vol 6, pages 403-415, 1986, in view of Zhang, et. al., Germin-like oxalate oxidase, a hydrogen peroxide producing enzyme, accumulates in barley attacked by the powdery mildew fungus, The Plant Journal, vol. 8, pages 139-145, 1995. and applicant's admitted prior art (specification p.1, lines 12-22).

Applicant traverses primarily that the inventiveness of the claimed method is bases on the combination of transformation by Agrobacterium rhizogenes and visual sorting of the transformation events, based on coloring, and Zhang et. al. do not teach the use of visual selectable marker(Response, p. 13-14).

Applicant's traversal is unpersuasive. Applicant's arguments are not commensurate in cope with the claims. None of the claims recite a combination of transformation by Agrobacterium rhizogenes and visual sorting of the transformation events, based on coloring, or a visual selectable marker.

Remarks

9. No claims are allowed.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Georgia L. Helmer whose telephone number is 571-272-0796. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amy Nelson can be reached on 571-272-0804. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Georgia Helmer PhD
Patent Examiner
Art Unit 1638
9 October 2004

ELIZABETH MCELWAIN
PRIMARY EXAMINER